In the claims

Claims 1-60 (Canceled)

61. (New) A field emission cathode comprising a diamondoid.

62. (New) The field emission cathode of claim 61, wherein the diamondoid is a lower diamondoid selected from the group consisting of adamantane, diamantane, and triamantane.

63. (New) The field emission cathode of claim 62, wherein the lower diamondoid comprises an underivatized lower diamondoid.

64. (New) The field emission cathode of claim 62, wherein the lower diamondoid comprises a derivatized lower diamondoid.

65. (New) The field emission cathode of claim 61, wherein the diamondoid is a higher diamondoid selected from the group consisting of tetramantane, pentamantane, hexamantane, heptamantane, octamantane, nonamantane, decamantane, and undecamantane.

66. (New) The field emission cathode of claim 65, wherein the higher diamondoid comprises an underivatized higher diamondoid.

67. (New) The field emission cathode of claim 65, wherein the higher diamondoid comprises a derivatized higher diamondoid.

68. (New) The field emission cathode of claim 61, wherein the electron affinity of a surface of the diamondoid is less than about 3.0 eV.

69. (New) The field emission cathode of claim 61, wherein the electron affinity of a surface of the diamondoid is negative.

70. (New) The field emission cathode of claim 61, wherein at least a portion of a surface of the diamondoid comprises carbon atoms that are substantially sp^3-hybridized.

71. (New) The field emission cathode of claim 61, wherein at least a portion of a surface of the diamondoid is derivatized such that the surface comprises both sp^2 and sp^3-hybridization.

72. (New) A field emission cathode comprising a diamondoid-containing material.

73. (New) The field emission cathode of claim 72, wherein the diamondoid-containing material is a polymerized film.

74. (New) The field emission cathode of claim 73, wherein the diamondoid content of the cathode ranges from about 1 to 100 percent by weight.

75. (New) The field emission cathode of claim 72, wherein the diamondoid-containing material is a CVD-deposited film.

76. (New) The field emission cathode of claim 75, wherein the diamondoid content of the cathode ranges from about 1 to 100 percent by weight.

77. (New) The field emission cathode of claim 72, wherein the diamondoid-containing material is a sintered ceramic or a ceramic composite.

78. (New) The field emission cathode of claim 77, wherein the diamondoid content of the cathode ranges from about 1 to 99.9 percent by weight.

79. (New) The field emission cathode of claim 72, wherein the diamondoid-containing material is a self-assembled film.

80. (New) The field emission cathode of claim 79, wherein the diamondoid content of the cathode ranges from about 1 to 99.9 percent by weight.

81. (New) The field emission cathode of claim 72, wherein the diamondoid-containing material comprises a lower diamondoid selected from the group consisting of adamantane, diamantane, and triamantane.

82. (New) The field emission cathode of claim 72, wherein the diamondoid-containing material comprises a higher diamondoid selected from the group consisting of tetramantane, pentamantane, hexamantane, heptamantane, octamantane, nonamantane, decamantane, and undecamantane.

83. (New) The field emission cathode of claim 72, wherein the diamondoid-containing material comprises a mixture of lower and higher diamondoids, wherein the lower diamondoid is selected from the group consisting of adamantane, diamantane, and triamantane, and wherein the higher diamondoid is selected from the group consisting of tetramantane, pentamantane, hexamantane, heptamantane, octamantane, nonamantane, decamantane, and undecamantane.

84. (New) The field emission cathode of claim 72, wherein a surface of the diamondoid-containing material has an electron affinity that is less than about 3.0 eV.

85. (New) The field emission cathode of claim 72, wherein a surface of the diamondoid-containing material has an electron affinity that is negative.

86. (New) The field emission cathode of claim 72, wherein a surface of the diamondoid-containing material comprises carbon atoms that are substantially sp^3-hybridized.

87. (New) The field emission cathode of claim 72, wherein a surface of the diamondoid- containing material is derivatized such that the surface comprises both sp^2 and sp^3-hybridization.

88. (New) A field emission device comprising:

(a) a cathode comprising a diamondoid-containing filament and a filament electrode, wherein a surface of the diamondoid-containing filament opposite the filament electrode has an electron affinity less than about 3 eV;

(b) a faceplate positioned adjacent to the cathode, the faceplate having a phosphorescent coating on a side of the faceplate facing the cathode;

(c) an anode positioned on an opposite side of the faceplate from the cathode; and

(d) a power supply for supplying a potential difference between the anode and the cathode.

89. (New) The field emission device of claim 88, wherein the electron affinity of the surface of the diamondoid-containing filament opposite the filament electrode is negative.

90. (New) The field emission device of claim 88, wherein the surface of the diamondoid-containing filament opposite the filament electrode comprises carbon atoms that are substantially sp^3-hybridized.

91. (New) The field emission device of claim 88, wherein the potential difference between the anode and the cathode is less than about 10 volts.

92. (New) A method of producing electron emission from a field emission device, the method comprising the steps of:

a) providing a cathode adjacent to an anode of the field emission device, the cathode comprising a diamondoid-containing filament and a filament electrode; and

b) applying a potential difference between the filament electrode of the cathode and the anode.

93. (New) The method of claim 92, further comprising the step of allowing electron tunneling to occur between the filament electrode and a surface of the diamondoid-containing filament opposite the filament electrode.

94. (New) The method of claim 92, wherein the potential difference applied between the anode and the filament electrode of the cathode is less than about 10 volts.